

Claims

1. A switchable magnetic device comprising a housing having a low magnetic reluctance path, a first permanent magnet, a second permanent magnet, said first and second permanent magnets being diametrically polarised, said first and second permanent magnets being mounted within the housing such that the first and second permanent magnets are rotatable relative to each other, and actuation means for causing relative rotation of the first and second permanent magnets, wherein said device presents a relatively strong external magnetic field when said first and second permanent magnets are positioned relative to each other such that a north and south poles of the first magnet are in substantial alignment with respective north and south poles of the second magnet, and the device presents a relatively weak external magnetic field when the first and second magnets are positioned relative to each other such that the north pole of the first magnet is in substantial alignment with the south pole of the second magnet and vice versa.
2. A device as claimed in claim 1 wherein the first and second magnets are substantially disc-shaped.
3. A device as claimed in claim 1 wherein the first and second magnets are mounted in the housing such that a face of the first magnet is opposed to the face of the second magnet.
4. A device as claimed in claim 3 wherein one magnet is positioned above the other magnet.
5. A device as claimed in claim 1 wherein one magnet is fixedly mounted in the housing and the other magnet is able to rotate within the housing.
6. A device as claimed in claim 5 wherein the other magnet is rotated through 180° to vary the device from a state having a relatively strong external magnetic field to a state having a relatively weak external magnetic field.
7. A switchable magnetic device comprising a housing, a first permanent magnet, a second permanent magnet, said first and second permanent magnets being diametrically polarised, said first and second permanent magnets being mounted within the housing such that the first and second permanent magnets are rotatable relative to each other, and actuation means for causing relative rotation of the first and second permanent magnets, wherein said device

presents a relatively strong external magnetic field when said first and second permanent magnets are positioned relative to each other such that a north and south poles of the first magnet are in substantial alignment with respective north and south poles of the second magnet, and the device presents a relatively weak external magnetic field when the first and second magnets are positioned relative to each other such that the north pole of the first magnet is in substantial alignment with the south pole of the second magnet and vice versa, wherein the housing comprises two pole pieces.

8. A device as claimed in claim 7 wherein the housing is made as a unitary construction or from a single piece of material.

10 9. A device as claimed in claim 8 wherein two portions of the housing have reduced cross sectional area such that the housing acts as two passive poles.

10. A device as claimed in claim 8 wherein portions of the housing are treated such that the portions become non-magnetic to thereby result in the housing acting as two passive poles.

15 11. A device as claimed in claim 7 wherein the housing defines a chamber in which the first and second magnets are mounted.

12. A device as claimed in claim 11 wherein the chamber has open ends.

13. A device as claimed in claim 12 wherein one or more chambers closing means close one or more open ends of the chamber.

20 14. A device as defined in claim 12 wherein a lowermost of the first magnet and the second magnet closes a lower end of the chamber.

15. A device as claimed in claim 11 wherein the chamber has closed ends.

16. A device as claimed in claim 7 wherein the housing is made from a material having a low magnetic reluctance.

25 17. A device as claimed in claim 16 wherein the housing is made from soft steel, iron or a permalloy.

18. A device as claimed in claims 7 wherein the pole pieces are shaped to maximise the external magnetic field.

19. A device as claimed in claim 18 wherein the poles are of minimum length.

20. A device as claimed in claim 7 wherein the actuation means comprises a handle
5 or knob connected to one of the magnets.

21. A device as claimed in claim 20 wherein the handle or knob is connected to one of the magnets via one or more intermediate members.

22. A device as claimed in claim 20 in which the handle or knob is actuated manually, electrically, pneumatically, hydraulically or by the action of expansion of a bimetallic
10 strip.

23. A device as claimed in claim 7 wherein the first and second magnets comprise rare earth type magnets.

24. A switchable magnetic device comprising a housing, a first permanent magnet, a
second permanent magnet, said first and second permanent magnets being essentially
15 cylindrically shaped, said first and second permanent magnets being diametrically polarised, said first and second permanent magnets being mounted within the housing such that the first and second permanent magnets are rotatable relative to each other, and actuation means for causing relative rotation of the first and second permanent magnets, wherein said device presents a relatively strong external magnetic field when said first and second permanent
20 magnets are positioned relative to each other such that a north and south poles of the first magnet are in substantial alignment with respective north and south poles of the second magnet, and the device presents a relatively weak external magnetic field when the first and second magnets are positioned relative to each other such that the north pole of the first magnet is in substantial alignment with the south pole of the second magnet and vice versa.